

**IN THE CLAIMS:**

1. (PREVIOUSLY PRESENTED) A method of using transformational arrays to emulate model behavior for a programmable logic controller logical verification system, said method comprising the steps of:

constructing a mechanical model using a computer;

generating transformational arrays for the mechanical model by incrementally recording one position of each piece of geometry of the mechanical model moved through space over a period of time using the computer;

viewing motion of the mechanical model in a motion viewer based on the transformational arrays using the computer;

determining whether the motion of the mechanical model is acceptable;

replicating the motion of the mechanical model by generating a PLC code for the motion of the mechanical model using the computer if the motion of the mechanical model was acceptable; and

using the accepted motion of the mechanical model to compare the behavior of the PLC code relative to the accepted motion by playing the PLC code with a PLC emulator.

2. (ORIGINAL) A method as set forth in claim 1 wherein said step of constructing comprises using a mechanical tool design system to construct the mechanical model.

3. (ORIGINAL) A method as set forth in claim 2 including the step of constructing an electromechanical model.

4. (ORIGINAL) A method as set forth in claim 3 wherein said step of constructing the mechanical model includes binding the electromechanical model to the mechanical model.

5. (ORIGINAL) A method as set forth in claim 4 wherein said step of constructing the electromechanical model comprises using a PLC logical verification system to construct the electromechanical model.

6. (PREVIOUSLY PRESENTED) A method as set forth in claim 1 wherein said step of generating transformational arrays comprises generating the transformational arrays based on computer aided design (CAD) geometries of the mechanical model.

7. (ORIGINAL) A method as set forth in claim 6 including the step of exporting the mechanical model to a control system design system.

8. (ORIGINAL) A method as set forth in claim 7 including the step of constructing a motion file based on the mechanical model and transformational arrays.

9. (ORIGINAL) A method as set forth in claim 8 wherein said step of displaying further comprises playing the motion file by a motion player.

10. (ORIGINAL) A method as set forth in claim 8 including the step of returning to the mechanical tool design system if the motion of the mechanical model is not acceptable.

11. (PREVIOUSLY PRESENTED) A method of using transformational arrays to emulate model behavior for a programmable logic controller logical verification system, said method comprising the steps of:

constructing a mechanical model using a computer;

generating CAD transformational arrays for motion in the mechanical model by incrementally recording one position of each piece of geometry of the mechanical model moved through space over a period of time using the computer;

constructing a motion file based on the mechanical model and the CAD transformational arrays using the computer;

viewing the motion of the motion file in a motion viewer using the computer;

determining whether the motion of the mechanical model is acceptable;

replicating the motion of the mechanical model with motion commands in a PLC code using the computer if the motion of the mechanical model was acceptable; and

using the accepted motion of the mechanical model to compare the behavior of the PLC code to the accepted motion by playing the PLC code with a PLC emulator.

12. (ORIGINAL) A method as set forth in claim 11 wherein said step of constructing comprises using a mechanical tool design system to construct the mechanical model.

13. (ORIGINAL) A method as set forth in claim 12 including the step of constructing an electromechanical model.

14. (ORIGINAL) A method as set forth in claim 13 wherein said step of constructing the mechanical model includes binding the electromechanical model to the mechanical model.

15. (ORIGINAL) A method as set forth in claim 14 wherein said step of constructing the electromechanical model comprises using a control system design system to construct the electromechanical model.

16. (ORIGINAL) A method as set forth in claim 11 wherein said step of generating comprises generating CAD transformational arrays based on computer aided design (CAD) geometries of the mechanical model.

17. (PREVIOUSLY PRESENTED) A method as set forth in claim 11 including the step of exporting the mechanical model to the PLC emulator.

18. (ORIGINAL) A method as set forth in claim 11 wherein said step of displaying further comprises playing the motion file by a motion player.

19. (ORIGINAL) A method as set forth in claim 11 including the step of returning to the mechanical tool design system if the motion of the mechanical model is not acceptable.